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Barnes & Thornburg
11 South Meridian Street
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EXAMINER

VU, NGOC K

ART UNIT PAPER NUMBER

2623

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/088,127

Applicant(s)

EMSLEY ET AL.

Examiner

Ngoc K. Vu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21, 25-46 and 50 is/are rejected.
- 7) ☒ Claim(s) 22-24 and 47-49 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objection

1. Claim 8 is objected to because of the following informalities: the limitation "an output of the first mixer" in lines 2-3 appears referring to an output of the first local oscillator. Accordingly, the terms "a first mixer coupled to receive an output of the first mixer" in claim 8 should be changed to – a first mixer coupled to receive an output of the first local oscillator---. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-5 and 26-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Heinonen et al. (US 6,389,087).

Regarding claim 1, Heinonen et al. discloses in figure 1 an apparatus for testing the phase linearity of a network, the apparatus including a first device (102) producing test signals (pilot signals at difference time slot, Col. 4, lines 1-10) at spaced at known frequency intervals and with predictable phase relationships and a second device (106) for receiving the signals, determining their phase relationships (by 116, Col. 4, lines 64-Col. 5, lines 30), comparing the determinephase relationship to exected phase relationship among the signals (Col. 5, lines 25-30), and determining the phase linearity from the comparison, the first and second devices being adapted for coupling to the network.

Regarding claim 2, because the first device is a wireless transmitter, it is inherent that the first device is capable of producing a first test signal having a first center frequency, first lower frequency spectral components, and first higher frequency spectral components, and the second device is capable of determining phase relationships for multiple spectral components of the first test signal.

Regarding claim 3, because the first device is a wireless transmitter, it is inherent that the first device is capable of producing a second test signal having a second center frequency, second lower frequency spectral components, and second higher frequency spectral components, and the second device being capable of determining phase relationships for multiple spectral components of the second test signal.

Regarding claim 4, figure 1 shows that the second device is capable of comparing phase relationships among multiple frequency components of the first and second test signals to determine the phase linearity of the network (col. 5, lines 7-13).

Regarding claim 5, figure 1 shows that the first device includes a generator for generating least one of a frequency modulation (FM) signal, an amplitude modulation (AM) signal and phase modulation (PM) signal, and the second device is capable of tuning across a range of frequencies produced by the generator and processing information from the tuned frequencies.

Claims 26-30 recite similar limitations of claims 1-5. Therefore, they are rejected for the same reasons. See rejection of claims 1-5 above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6-8 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinonen et al. (US 6,389,087) in view of Chen (US 5,784,413).

Regarding claim 6, Heinonen et al.'s figure 1 fails to teach the detail of transmitter 102. However, Chen's figure 5 shows a transmitter circuit that provides signal having good output spectrum with low spurious signals levels. Therefore, it would have been obvious to one having ordinary skill in the art to use Chen's transmitter for Heinonen's transmitter for the purpose of improving the operation of the communication system. Thus, the modified Heinonen's figure 1 further discloses the first device includes a first digital signal processor (DSP), circuit, not shown that provides signal to Chen's node 205.

Regarding claim 7, the modified Heinonen's figure 1 shows that the first device includes a direct digital synthesizer (DDS) (Chen's 210).

Regarding claim 8, the modified Heinonen's figure 1 shows that the first device includes a first local oscillator (Chen's 510, 310), a first mixer (305) coupled to receive an output of the first local oscillator, and a first filter (320) coupled to receive the output of the first mixer.

Claims 31-33 recite similar limitations of claims 6-8. Therefore, they are rejected for the same reasons.

6. Claims 9-11, 14-21, 34-36 and 39-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinonen et al. (US 6,389,087) in view of Madsen (US 5,453,714).

Regarding claim 9, Heinonen's figure 1 fails to show the detail of the demodulator. However, Madsen 3 shows an example of a demodulator having down converter 110 in figure 3, which the detail shown in figure 4. The demodulator has an adjustable resonant frequency to allow compensating of phase shifts cause by temperature variations or shifts in the carrier frequency of the incoming signal. It would have been obvious to one having ordinary skill in the

art to use Madsen et al.'s demodulator for Heinonen's demodulator in order to take advantage of the above benefit for Heinonen circuit. Thus, the modified Heinonen's figure 1 further shows that the second device includes a second mixer (144) for mixing the received test signal, and a second filter (146) coupled to the second mixer.

Regarding claim 10, the modified Heinonen circuit further shows that the second device further includes a digital signal processor (DSP) capable of fast Fourier transforming (FFTing) a signal related to the output of the second filter to produce a signal related to the determined phase relationship (col. 5, lines 1-15).

Regarding claim 11, the modified Heinonen's figure 1 shows the second filter includes a bandpass filter having a center frequency substantially equal to a center frequency of the test signals and a sufficiently narrow bandwidth to reject frequencies lower than lower frequency components of the test signals and higher than higher frequency components of the test signals (inherent characteristics of bandpass filter).

Regarding claim 14, the modified Heinonen's figure 1 shows at least one of the first and second devices (second device) includes a device (Madsen et al.'s down converter) for producing a signal for synchronizing the transmission by the first device and reception by the second of the test signals.

Regarding claim 15, the modified Heinonen's figure 1 shows that the first and second devices include information concerning the test frequencies, the synchronizing signals causing the first and second devices to transmit and receive multiple test frequencies in an established sequence.

Regarding claim 16, the modified Heinonen's figure 1 shows that the one of the first and second devices includes a device (the down converter) for transmitting the synchronizing signal on the network.

Regarding claim 17, the modified Heinonen's figure 1 shows at least one of the first and second devices (first device) is further adapted for transmitting information related to the determined phase relationships through the network at least the other of the first and second devices (signals from the first devices transmitted to the second device via antennas).

Regarding claim 18, the modified Heinonen's figure 1 shows that the at least one of the first and second devices adapted for transmitting information related to the determined phase relationships through the network is adapted for transmitting the information through a network channel dedicated to the transmission of the information (inherent characteristic of transmitter and receiver).

Regarding claim 19, the modified Heinonen's figure 1 shows that the at least one of the first and second devices adapted for transmitting the information through a network channel dedicated to the transmission of the information includes a device adapted for transmitting the information by frequency shift keying (FSK) (Col. 5, lines 1-15).

Regarding claim 20, the modified Heinonen's figure 1 shows that at least one of the first and second devices (second device) is further adapted for producing a signal (by Madsen's down converter) for synchronizing the transmission by the first device and reception by the second device of the test signals, the information related to the determined phase relationships being transmitted in the same channel as the synchronizing signal.

Regarding claim 21, figure 1 shows that the second device is further adapted for determining the amplitude of the received test signals (Madsen's LNA 140 detects and amplified the amplitude of the received signals).

Claims 34-36 and 39-46 recite similar limitations of claims above. Therefore, they are rejected for the same reasons.

7. Claims 12, 13, 25, 37, 38 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinonen et al. (US 6,389,087).

Regarding claim 12, Heinonen's figure 1 fails to show that the second device is capable of employing a Bessel function to perform at least one of receiving the signals, determining their phase relationships, comparing the determined phase relationships to expected phase relationships among the signals, and determining the phase linearity from the comparison. However, Bessel function is well known calculation method. It is seen as design reference to select Bessel function as calculation method in Heinonen dependent upon particular environment of use to ensure optimum performance.

Regarding claim 13, the modified Heinonen's figure 1 shows that the second device includes a table containing values of the Bessel function for use in evaluating the Bessel function (inherent for Bessel function calculation method).

Regarding claim 25, Heinonen's figure 1 fails to shows that the second device further includes a user interface for displaying an output related to the determined phase relationship. However, it would have been obvious to one having ordinary skill in the art to couple a user interface to the Heinonen's circuit figure 1 for the purpose of providing visual information to designer.

Claims 37, 38 and 50 recite similar limitations of claims above. Therefore, they are rejected for the same reasons.

Allowable Subject Matter

8. Claims 22-24 and 47-49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 22 and 47 would be allowable because the prior art fails to teach or suggest that the at least one of the first and second devices adapted for determining the amplitudes of the received test signals is further adapted for comparing the amplitudes of the received test signals to each other to determine variation of the amplitude of the frequency response characteristic across the frequencies contained in the test signals.

Claims 23, 24, 48 and 49 would be allowable because the prior art fails to teach or suggest that the at least one of the first and second devices adapted for determining the amplitudes of the received test signals is further adapted for comparing the amplitudes of the received test signals to the amplitudes of the transmitted test signals.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bowen et al. (US 6,385,267) teaches a system and method for locking disparate video formats. Dekker (US 6,239,660) teaches a method for controlling a frequency synthesizer. Sato et al. (US 5,412,694) teaches a data demodulator. Vasic teaches (US 5,809,089) teaches decoding method included Bessel function calculation means.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc K. Vu whose telephone number is 571-272-7306. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Miller can be reached on 571-272-7353. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ngoc K. Vu
Primary Examiner
Art Unit 2623

April 12, 2006